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# **FLOODPLAIN MANAGEMENT RECONNAISSANCE STUDY REPORT UPPER THORN CREEK PARK FOREST & UNIVERSITY PARK COOK & WILL COUNTIES**



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VILLAGES OF PARK FOREST & UNIVERSITY PARK

COOK & WILL COUNTIES, ILLINOIS

FLOODPLAIN MANAGEMENT

RECONNAISSANCE STUDY

Prepared by

US DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

Champaign, Illinois

In cooperation with

STATE OF ILLINOIS

DEPARTMENT OF TRANSPORTATION

DIVISION OF WATER RESOURCES

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# VILLAGES OF PARK FOREST & UNIVERSITY PARK

## RECONNAISSANCE STUDY

### INTRODUCTION

Use of floodprone areas can be a severe problem in Illinois. Urbanization and floodplain encroachment are increasing the severity of this problem. Over 800 communities in Illinois have been identified as having flood problems.

The Illinois Division of Water Resources (DWR) is the responsible state agency for urban flood control and for setting priorities of flood studies within urban areas. The Soil Conservation Service is providing assistance to the Division of Water Resources in setting these priorities. A joint coordination agreement was executed between the Division of Water Resources, State of Illinois, and the USDA, Soil Conservation Service on April 30, 1976 and revised in December 1978 to furnish technical assistance in carrying out Flood Hazard Studies. These studies are carried out in accordance with Federal Level Recommendation 3 of "A Unified National Program for Floodplain Management", and under Section 6 of Public Law 83-566. A plan of study was executed in October 1986 for reconnaissance studies for 4 Illinois communities. These reconnaissance studies will utilize existing floodplain information, historical high water profiles, and the 100 year floodplain from flood insurance studies when available. Average annual damages are estimated for the structures within the floodplain.

The study was conducted and the report provided to: 1) evaluate needs for additional future studies, 2) estimate average annual damages, 3) provide an updated estimate of the 100 year floodplain map, and 4) provide guidance and recommendations to the community for improved floodplain management.



## STUDY AREA DESCRIPTION

The Villages of Park Forest and University Park are located in southern Cook County and northeastern Will County, Illinois, about 28 miles south of Chicago, Illinois. The population of Park Forest is 26,222 and University Park is 6,245 according to the 1980 census.

The transportation facilities in the area include Interstate #57, Lincoln Highway (US#30), Illinois State Highway #50, and Governor's Highway. The Elgin Joliet and Eastern (EJ&E) railroad line passes through the north side of Park Forest and the Illinois Central Gulf (ICG) railroad line operates along the west and northwest sides of both villages. Metra, the Chicago area commuter rail system, has a station at University Park and follows the ICG railroad line to and from downtown Chicago.

This study covers the upstream reach of Thorn Creek which begins in an open agricultural area west of Monee Road in University Park in Will County and flows generally northeast through Park Forest and University Park to Sauk Trail which is approximately a mile upstream from Sauk Trail Lake Dam. The approximate drainage area of Thorn Creek at Sauk Trail is 8.8 square miles and is in the Upper Mississippi River Basin, hydrologic unit #07120003, subwatershed #050. Portions of Park Forest and University Park are drained by Butterfield Creek and Deer Creek. The flooding from these streams is minimal in the Villages of Park Forest and University Park so Deer Creek and Butterfield Creek are not considered in this study.



This reach of Thorn Creek has its origin in open land but most of its floodway and floodplain is through wooded areas. Most of the wooded areas along Thorn Creek have been preserved with urban development occurring adjacent to these forest preserves. The upstream channel is characterized by modestly sloping banks with several small side tributaries having steep-sided ravines draining upland forest areas.

The average rainfall is 33 inches per year. March through October rainfall averages 3 inches per month while November through February averages 2 inches per month. Snowfall averages 30 inches annually.

The soils along Thorn Creek in the Cook County portion of this reach are Sawmill silty clay loam, Morley silt loam, and urban land soils of Markham-Ashkum, Orthents complex, and Frankfort-Bryce. The soils along Thorn Creek in the Will County portion of this reach are Huntsville loam, Morley silt loam, Blount silt loam, Eylar silt loam, Chatsworth silty clay, Frankfort silt loam and Bryce clay loam. Sawmill silty clay loam and Huntsville loam are bottomland soils along Thorn Creek that are high in organic matter and are unsuited for crop production and urban uses unless drainage and protection from flooding are provided. Markham-Ashkum, Orthents complex, and Frankfort-Bryce are soils that have a high clay content found with urban land altered soils in a residential area of Park Forest north of Thorn Creek along Monee Road. The high clay content of these soils makes them slow to drain like the nearly level Ashkum and Bryce soils and subject to erosion if not protected on the undulating to gently rolling Markham and Frankfort soils and the nearly level to steep Orthents complex soils. This area of Park Forest is fully developed and established. The Morley silt loam is a well-drained soil found on moderate to steep slopes in the floodplain fringes and is mainly in wooded, idle, or pastured areas. The Blount silt loam, Eylar silt loam,



Frankfort silt loam, and Chatsworth silty clay developed under deciduous hardwood forest on nearly level to strongly rolling topography. These soils have a high water holding capacity and are predominantly in woodland as part of the Thorn Creek Nature Preserve.

Deep wells into groundwater provide the communities water supply. University Park has a private waste water treatment plant and they report no septic systems. Park Forest has service for waste water treatment by the Thorn Creek Basin Sanitary District in Chicago Heights.

#### NATURAL VALUES

Thorn Creek and its floodplain are totally in the Cook County Forest Preserve District from Sauk Trail to the Cook-Will County line. This area is commonly called Sauk Trail Woods. In the Will County portion of this study reach, 76% of the channel length and 76% of the creek and floodplain are preserved as the Thorn Creek Nature Preserve. This area commonly called Thorn Creek Woods is a dedicated Illinois nature preserve from properties owned by the Villages of Park Forest and University Park, Illinois Department of Conservation, and the Forest Preserve District of Will County. The floodplain area that is not included in the dedicated nature preserve is predominantly woodland area. An environmental assessment of this study area in 1973 as part of the Little Calumet Watershed by Bauer Engineering noted that Thorn Creek Woods in Will County is one of the few areas left in the Chicago metropolitan area with relatively undisturbed woodlands. They found walnut, swamp white oak, red oak, ash, and elm on the Thorn Creek floodplain along with wildflowers, uncommon trees, shrubs, and other vegetation. There have been some modifications to the stream channel upstream of Park Forest and the addition of storm drain outlets from Park Forest but the floodplain remains essentially in its natural condition.



## FLOOD PROBLEMS

The Village of Park Forest in 1982 sent a stormwater survey questionnaire to 8500 households in Park Forest to identify the locations, types, and frequency of flooding. A report of the results of the questionnaire was published March 11, 1983, which concentrated on flooding problems in which water actually enters houses or rental units. The results showed 2.9% of single family households and 10% of multi-family households reported flooding in their units. Seven problem areas were identified in Park Forest. The problem areas with the type of flooding problems are as follows: 1) north of Indiana School at the west end of Indiana Street - sanitary backups, street and house flooding; 2) Wilson Court near Winnebago Park at the east end of Winnebago Street - street flooding and sanitary sewer backups; 3) Warwick Street near Warwick Court - sanitary sewer backups, back yard ponding and street flooding; 4) seepage and back yard ponding throughout the multi-family areas at various locations; 5) Monee Road between Blackhawk and Western parallel to Thorn Creek - house flooding and back yard ponding; 6) Mohawk School area south of Sauk Trail between Shabbona and Blackhawk Drives - house flooding; 7) Lincolnwood area north of abandoned New York Central Railroad line - seepage at various locations. Seepage in multi-family areas is approximately 1/3 of all the village's flooding problems. The village determined that approximately 65% of the problems can be attributed to what they term "private" problems such as seepage, clogged sewer services and improper lot grading associated with building additions.

Park Forest has rolling and undulating topography that creates natural depressions throughout the village. The storm sewer system was designed to handle at least a 10-year storm. The sewer system plus flow in the streets is designed to a 100-year storm capacity without flooding any houses. House flooding does occur for storm frequencies greater than the 100-year storm. Traffic being allowed on rain-swollen streets can cause wave action which raises the flood levels on the houses and causes erosion to yards and landscaping.





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Springer Federal Building  
301 North Randolph Street  
Champaign, Illinois 61820

April 29, 1988

National Agricultural Library  
10301 Baltimore Road  
Beltsville, Maryland 20705

Dear Gentlemen:

Enclosed for your information and use is a copy of the final Floodplain Management Reconnaissance Study for the Village of University Park and Park Forest, Cook and Will Counties, Illinois. This is a limited detail study done in cooperation with the Illinois Department of Transportation, Division of Water Resources.

Please contact Robert Bird at 217/398-5282 if you have any questions.

Sincerely,

JOHN J. ECKES  
State Conservationist

Enclosure

RAB:V7:48





On May 22, 1982, Park Forest registered 6.43 inches of rainfall which is higher than the 24-hour, 100-year storm frequency rainfall. Village officials report that Thorn Creek reached record levels in the Park Forest/University Park area with some flooding on Monee Road. These village officials attribute the higher stages to debris blockages on Thorn Creek at Western Avenue. The Glenwood gauge, 5.6 miles downstream on Thorn Creek, did not show the May, 1982, flood stage to be the flood of record, but it was at the 100-year frequency elevation. Debris blockages on Thorn Creek at Western Avenue in the 1982 storm raised the flood stages to record levels at Park Forest/University Park, but showed lower stages at the Glenwood gauge. Almost all of the channel in this area is through woodland and Forest Preserve land so the amount of debris is plentiful. The Village indicated that the bridges at Western Avenue and Sauk Trail had been replaced so the debris buildup should be lessened, but still could be a problem if allowed to accumulate.

Thorn Creek passes through primarily woodland areas of Cook County Forest Preserve District's Sauk Trail Woods and through Will County's Thorn Creek Woods. In the Will County portion of this reach, Thorn Creek is in and out of the Nature Preserve, Park Forest, University Park, and unincorporated areas of Will County. Park Forest and University Park have no houses that flood along Thorn Creek. There are a couple of houses in unincorporated Will County between Monee Road and Thorn Creek that have had problems from either flooding, seepage, or sewer backup. There has been some flooding to Monee Road and in the area of Monee Road and Stuenkel Road.

Park Forest has a large storm drain outlet in Chicago Heights immediately downstream of the Elgin Joliet & Eastern railroad crossing of Thorn Creek. Hikers, kids, or fishermen have worn paths around the headwall and wingwalls of this storm sewer outlet. Hazardous conditions exist where the slopes above the headwall and wingwalls are very steep and slippery with a rock plunge pool below. These conditions could result in a serious accident.



## PROBLEM SUMMARY

Estimated average annual damages to the Villages of Park Forest and University Park are listed below.

Problems due to stormwater:

Type of Damage	Average Annual Damages
Seepage	\$ 3000
Storm sewer cleanouts	2000
Sanitary sewer cleanouts	4000
Yard and landscaping damage	2000
Debris cleanup of Thorn Creek	<u>3000</u>
Total estimated damages	\$14000

All houses within village limits are at an elevation above the 100-year frequency storm level. Damages as noted above can occur for frequencies greater than the 10-year frequency storm.



## EXISTING FLOODPLAIN MANAGEMENT

Park Forest and University Park have participated in the regular phase of the National Flood Insurance Program since July 16, 1980; Cook County has since April 15, 1981; and Will County has since April 15, 1982. The latest floodplain maps being used by these four governmental entities are: Park Forest and University Park, July 16, 1980; Will County, April 15, 1982; and Cook County, December 4, 1984.

The Little Calumet River Watershed Environmental Assessment was prepared by Bauer Engineering, Inc, Chicago, Illinois, in July 1973. This report was prepared for the SCS in developing the Chicago Metropolitan Area River Basin Plan. The Little Calumet River Watershed portion of the River Basin Plan was completed in May 1975, and included floodplain maps and profiles dated September 1975.

A PL-566 Watershed Plan and Environmental Impact Statement was prepared for the Little Calumet River Watershed on November 1978, that included floodplain information maps and profiles. The floodplain map in this report agrees with the 1978 map and the flood insurance floodplain maps. Park Forest and University Park are enforcing their zoning ordinances, sediment and erosion control ordinances, and building permits authority. University Park does not have a stormwater management ordinance for new developments, but is interested in getting one developed.



## RECOMMENDATIONS

It is recommended that the Villages of Park Forest and University Park continue to participate in the National Flood Insurance Program.

The Village of University Park should develop a stormwater management ordinance so that new development does not increase the flood stages of Thorn Creek. The local District Conservationist will provide them with a model ordinance as requested.

Because of the undulating terrain and natural depressional areas both villages should monitor new construction, additions to existing houses, and adding garages or other structures to insure that proper drainage is considered and that the structures are above flooding elevations. This should be handled through the building permit review process.

Periodic cleaning of sanitary sewers in problem areas should be continued. Inspection and cleaning of storm sewer inlets and catch basins should be continued particularly in the known problem areas. Park Forest reports that their sanitary sewer backup problems have been solved by their Sanitary Sewer Rehabilitation Program.

Many of the problems with homes are so-called "private" problems of the individual homeowner, the villages and county should have floodproofing information available for the local homeowner. Illinois Department of Transportation, Division of Water Resources, has information on various floodproofing methods in its Local Assistance Series 3B Manual, "Protect Your Home From Flood Damage", and "Flooded Basements: A Homeowner's Guide".



Areas identified with inadequate storm sewers and street flooding should be considered for additional capacity to the street, the storm sewer, or additional relief storm sewers. If wave action from traffic on these flooded streets is causing erosion or increased flood stages, then the police or public works department should close the streets until the street flooding subsides.

The Villages of Park Forest and University Park should work with Nature Preserve personnel in Will County and Forest Preserve personnel in Cook County to assure that the debris buildup in Thorn Creek is kept at a manageable level so that it does not cause higher flood stages along Thorn Creek from blockages or jams.

Most of Thorn Creek in this study reach is in the Thorn Creek Nature Preserve. Areas of Thorn Creek floodplain that are not in the nature preserve now, should be obtained as they become available, especially areas of undisturbed woodlands.

The Village of Park Forest should work with the City of Chicago Heights to make changes to improve the safety of Park Forest's storm sewer outlet to Thorn Creek. A safety railing on the headwall and wingwalls and protective fencing are methods of providing protection.

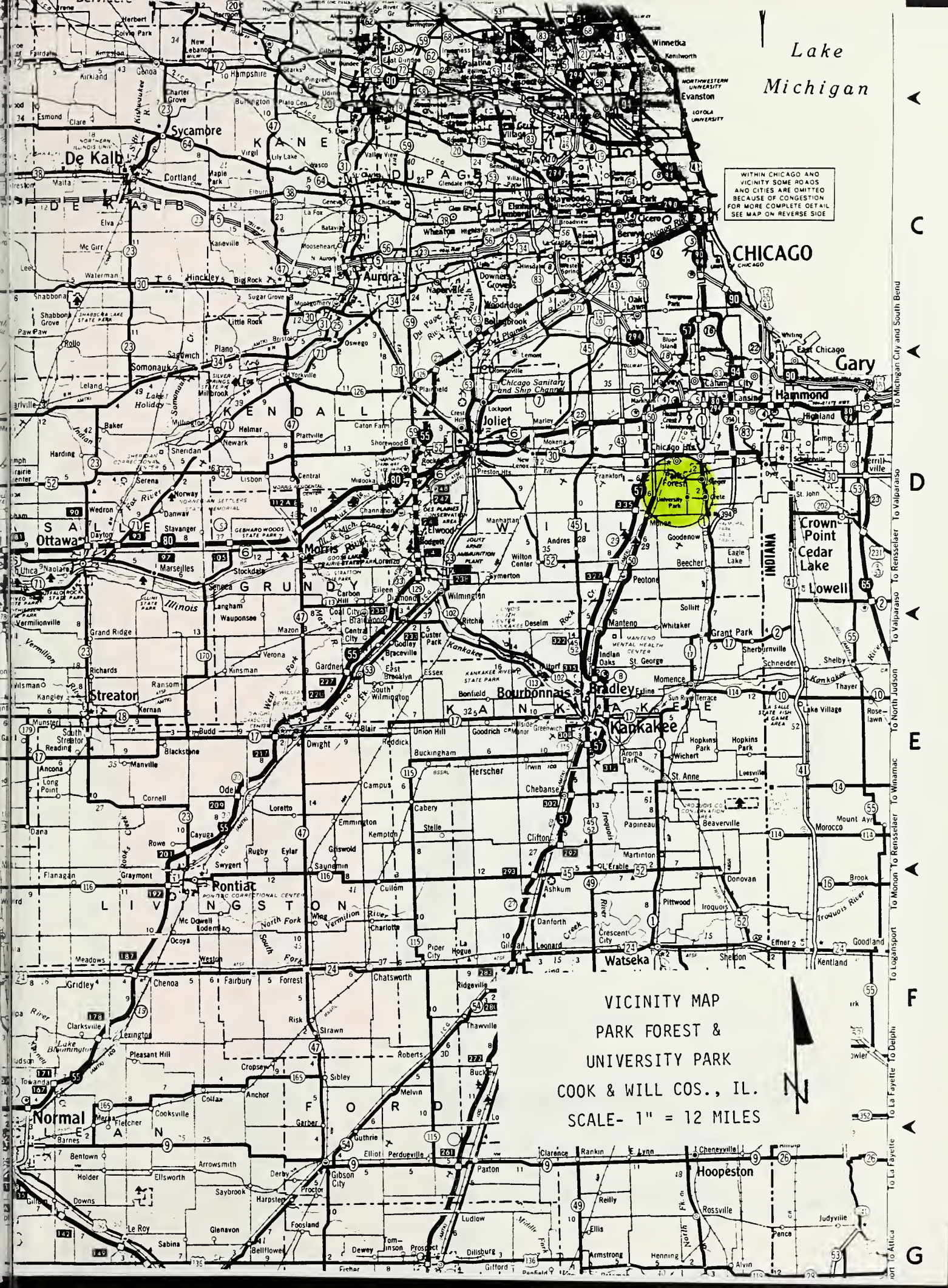
A low priority should be assigned for a future detailed floodplain management study for Thorn Creek in the vicinity of Park Forest and University Park.



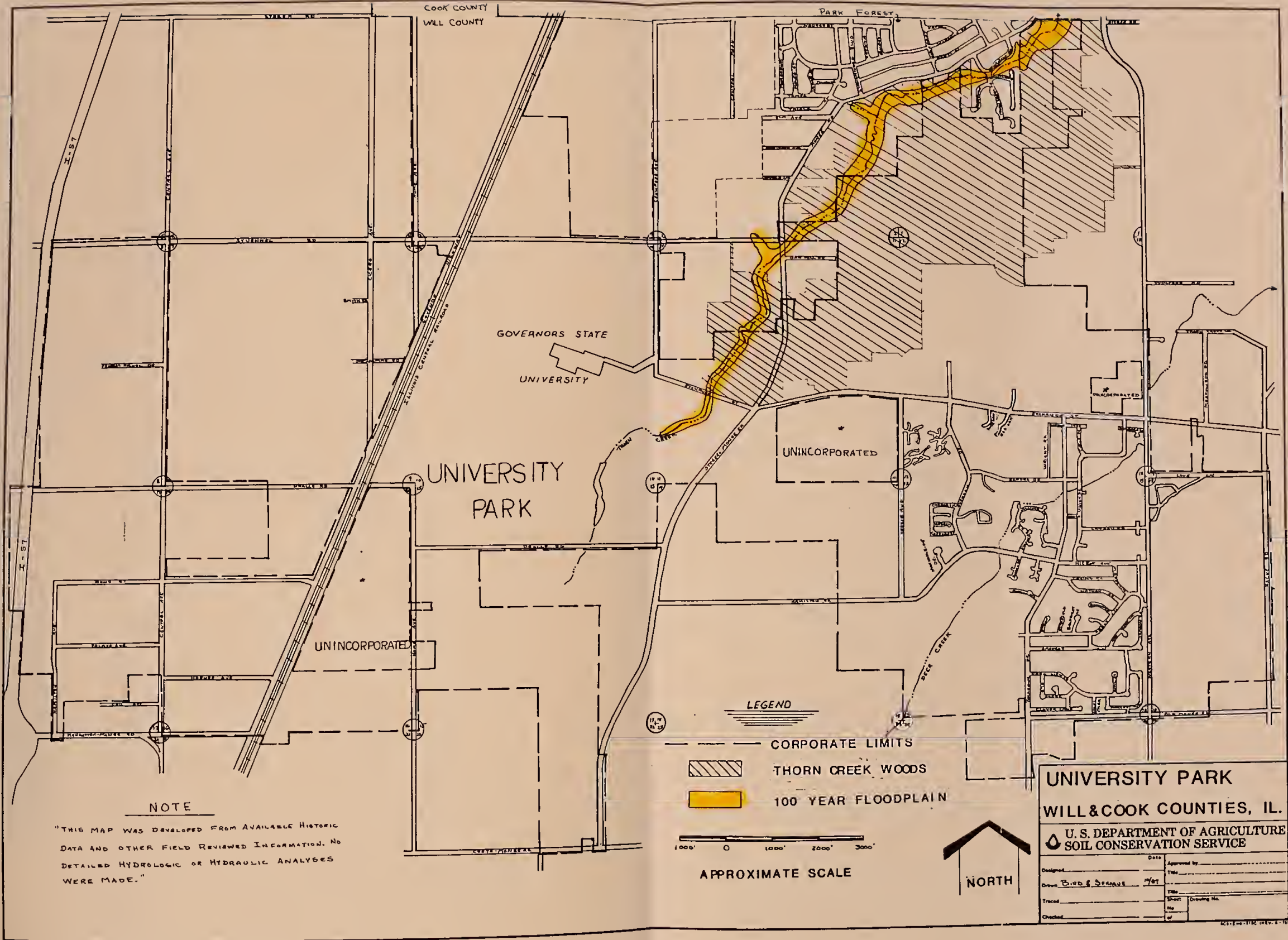
## INVESTIGATION AND ANALYSIS

No additional calculations, discharges, or profiles were made as a part of this study. The inventory of flooding and water problems were determined from a review of the Little Calumet River Environmental Assessment prepared in 1973; Chicago Metro Area River Basin Report for Little Calumet River prepared in 1975; Little Calumet River Watershed work plan and environmental impact statement prepared in 1978; Will County Soil Survey 1962; Cook County Soil Survey, 1976; a field review and interviews with local citizens. The floodway and flood boundary maps, flood insurance maps and reports, river basin and watershed floodplain maps and profiles, USGS surface water gauge records, along with interviews of local citizens were used to determine the 100-year floodplain. Aerial photographs were provided by the Division of Water Resources. Damages were based on estimates during the field review. The summary report of Park Forest's results of their stormwater flooding questionnaire dated March 1983, was used for information on flooding problems in Park Forest.

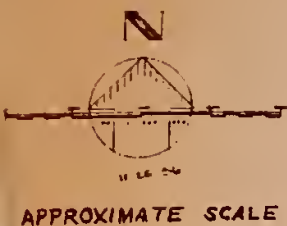












VILLAGE OF OLYMPIA FIELDS

VILLAGE OF MATTESON

PARK FOREST

CITY OF CHICAGO

CHICAGO HEIGHTS

PARK FOREST STORM SEWER OUTLET

SAUK TRAIL DAM

SAUK TRAIL

FOREST

PRESERVE

NOTE

"THIS MAP WAS DEVELOPED FROM AVAILABLE HISTORIC DATA AND OTHER FIELD REVIEWED INFORMATION. NO DETAILED HYDROLOGIC OR HYDRAULIC ANALYSES WERE MADE."

LEGEND

- CORPORATE LIMITS
- 100 YEAR FLOODPLAIN
- THORN CREEK WOODS
- SAUK TRAIL WOODS

THORN CREEK WOODS

PARK FOREST GOLF CENTER

UNIVERSITY PARK

THORN CREEK-PARK FOREST  
COOK & WILL COUNTIES, IL



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